

VOICE CONTROLLED ROBOT USING ARDUINO MICROCONTROLLER

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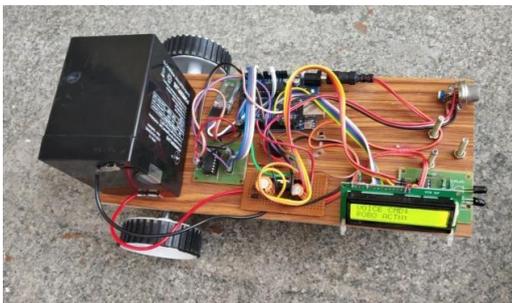
Abstract-A robot is a machine which is capable of carrying out a complex series of actions automatically, especially one programmable by a computer. A robot can be controlled by a human operator from a great distance as a person couldn't carry the computer where ever he goes and also as RF waves are available both in LOS and non-LOS regions they can be easily intruded by hackers. So these became major drawbacks if we use RF based robot via computer. In order to overcome these draw back we opt VOICE CONTROLLED MOBILE ROBOT. Voice Controlled Robotic System is very beneficial in the areas where there is a high risk for humans to enter. Voice control robot is an android based device whose movements can be controlled by the user by giving a specific voice command. The speech is received by android OS and processed by Bluetooth module. When a command for robot is recognised, then the Bluetooth module sends a command message to the robot microcontroller. The microcontroller analysis the message and appropriate actions. When any commands are given to the transmitter, the Bluetooth module will take the voice commands and converts them into digital signals. In addition to this smoke sensors are used in detecting smoke level and a GSM module is used to send messages about the level. An obstacle detector is added to protect the system from obstacles.

I. INTRODUCTION

Speech signals are the most significant means of communication in human beings. Almost every conversation to interact is done by means of voice signals. Sounds and various speech signals can be converted into electrical form using a microphone. Voice recognition is a technology which is used to convert the speech signals into a text format. This voice recognition technology can be used to control and generate speech acknowledgement using some external server.

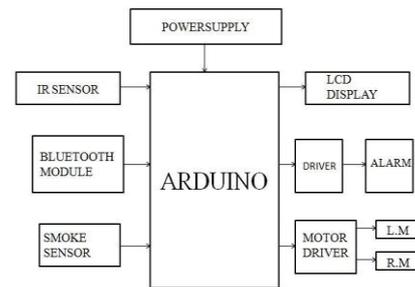
Robot has the ability to understand thousands of voice commands and perform required action. In this paper, we develop a robot that can be operated using speech commands.

II. CONSTRUCTION AND WORKING



Voice controlled robotic system aims at achieving successful detection of gases where human intervention is at high risk such as mines, war fields, disaster affected zone, etc. It also aims to fulfill the task assigned to the user through various commands. The voice commands to the robotic system are sent through Bluetooth via an Android device. These commands are received on the robotic system via Bluetooth module mounted on it. A robot chassis uses an ultrasonic sensor which is able to detect the obstacles along with an lcd screen to view the received commands. The motor driver circuit is used to control the speed of robotic system

Block Diagram



III. COMPONENTS

- A. Arduino Uno
- B. Rechargeable Battery
- C. LCD Screen
- D. Motor Driver
- E. IR Sensor
- F. Bluetooth Module
- G. Smoke Sensor
- H. Robot Chassis
- I. Buzzer

1) Arduino Uno

Arduino Uno, a microcontroller board depends on the ATmega328P. It has 14 computerized information/yield pins (of which 6 can be utilized as PWM yields). It likewise has 6 simple information sources, a 16 MHz quartz gem, a USB association, a power jack, an ICSP header and a reset catch. It is the most generally utilized and easy to use microcontroller. Essentially interface it to a PC with a USB link or power it with an AC-to-DC connector or battery to begin.



IV. RECHARGEABLE BATTERY



A rechargeable battery, storage battery, secondary cell, or accumulator of electrical battery which can be charged, discharged into a load, and recharged many times, as opposed to a disposable or primary battery, which is supplied fully charged and discarded after use.

V. LCD SCREEN



LCD screen is a level board show, electronic visual showcase that utilizes the light-adjusting properties of fluid precious stones and the fluid gems don't discharge light specifically. LCDs are accessible to show discretionary pictures. It shows preset words, digits, and 7-portion shows. It has a wide scope of utilizations including PC screens, TVs, instrument boards, airplane cockpit shows

VI. MOTOR DRIVER



Motor driver is a double H bridge drive chip - L293DN with voltage range of 5V-12V and current range of 0-36mA. Maximum power consumption is 25W, dimensions: 43 x 43 x 26mm, weight: 26g and a built-in 5v power supply, when the driving voltage is 7v-12v.

An Infrared sensor is an electronic device that emits in order to sense some aspects of the surrounding. An IR sensor can detect the motion of an object. The output is digital signal so it is easy to interface with any microcontroller such as Arduino Uno etc.

VII. BLUETOOTH MODULE



Bluetooth is a wireless technology standard for exchanging data over short distances using short-wavelength UHF radio waves in the ISM from 2.4 to 2.485 GHz from fixed and mobile devices, and building personal area networks. The first channel starts at 2402 MHz and continues up to 2480MHz in 1MHz steps. It usually performs 1600 hops per second, with Adaptive Frequency-Hopping (AFH) enabled.

VIII. SMOKE SENSOR



The MQ 135 Quality Detector Sensor Module For Arduino has lower conductivity. When the target combustible gas exists, the conductivity of the sensor is higher along with the gas concentration rising. The MQ 135 sensor has high sensitivity to Ammonia, Sulphide and Benzene steam, also sensitive to smoke and other harmful gases

IX. ROBOTIC CHASSIS:



The robot chassis is the framework of an artificial object, for development of any robotic arm project without spending a lot of money. It is best suitable for pick and place type robots and it can also be used for other robotic and IOT projects. It has a wide operating voltage range 5-12V. It is best suitable for object size up-to 11 cm. It has low power consumption and high torque

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X. COMMANDS

- A. Front – moves the vehicle in forward direction.
- B. Back- moves the vehicle in backward direction.
- C. Left – moves the vehicle towards left.
- D. Right – moves the vehicle towards right.
- E. Stop – stops the vehicle.

XI. ADVANTAGES

- A. Cost of system is low as we are using smart phone which is nearly available to everyone.
- B. Robot is small in size, so space required for it is small.
- C. We can access the robot from the distance of meters as we are using Bluetooth for the connection between robot and the mobile.

XII. RESULT

The working model was tested on ARDUINO. The function of robot is fully controlled by the voice of mobile. The robot will follow all the instructions given by the user.

XIII. CONCLUSION

Remote control is a standout amongst the most essential fundamental requirements for every single living being. Be that as it may, sadly because of gigantic measure of information and correspondence, innovation isn't completely used. A significant number of the remote – controlled robots make utilization of RF modules. Be that as it may, this, venture make utilization of an Android versatile for mechanical control which is modest and effectively accessible. The object of the paper is to lessen human endeavors at spots or circumstances where human intercessions are troublesome.

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